

# CARNEGIE

*Magazine*

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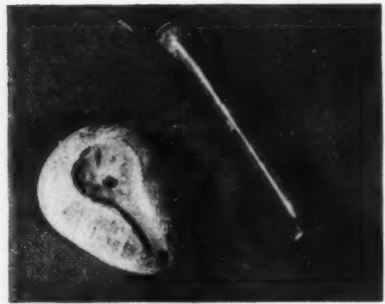


GORGONETTA MIRABILIS

UNIVERSITY OF MICHIGAN  
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*Phoenician glass vase on right and crude oil lamp from early Palestine on left. From the collection of the Carnegie Museum.*



## *The Economy of Palestine, Syria and Phoenicia*

*Approximately 800 B.C.-200 A.D.*

An integral part of the fabulously rich trade routes flowing from Eastern to Western civilization were the small countries of Palestine, Syria and Phoenicia in 800 B.C. to 200 A.D.

The constant stream of trade required a mode of exchange not easily accomplished by simple barter. Therefore, the great cities of this era adopted the use of coins. Each city had its mint and coins were easily recognized by distinctive mint marks. Coins helped accelerate trade, adding tremendously to the riches of these countries.

Along with trade growth, the internal economy of each country was advanced with the development of crafts and industries. Cities in these countries became famous for various products . . . Caesarea, for manufacturing veils . . . Tyre and Sidon, for beautiful purple dyes . . . Gaza, for silk-spinning and winding industry . . . Jerusalem, for manufacturing soap and rose oil.

Starting with an ideal geographical location, these countries energized their economic position by developing coins and simple banking. The same story holds true today. As our modern economy grew stronger and more prosperous, our monetary system and banking facilities were equally developed to meet our complex needs.

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OPEN 2:00 TO 6:00 P.M. NEW YEAR'S DAY

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SUNDAYS 2:00 TO 6:00 P.M.

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LUNCHEON 11:00 A.M. TO 2:00 P.M., WEEKDAYS

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REFERENCE SERVICES ONLY—2:00 TO 6:00 P.M. NEW YEAR'S DAY

### A SONG FOR THE SEASON

The Kings to the Stable  
They brought sweet spice,  
The gold and the silver,  
And jewels of price.

But the Dove by the manger  
She would not cease  
Mourning so softly:  
Bring Him Peace; bring Him Peace!

The Kings from the Orient  
Brought nard and clove.  
The Dove went mourning:  
Bring Him Love; bring Him Love.

\* \* \* \* \*

There is clash of battle,  
And men hate and slay:  
From the noise and the tumult  
She hides Him away.

But His sleep is fitful  
In His Mother's breast,  
The Dove goes mourning:  
Give Him rest; give Him rest!

—KATHARINE TYNAN

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### ... AND NEXT TO NATURE, ART

Two arts, those of glass-blowing and photography, combined to reproduce the striking design shown on this month's cover. The inspiration was neither a Christmas-tree ornament nor a canvas from the 1952 PITTSBURGH INTERNATIONAL, but a primitive sea animal whose fragile beauty is buried in biology texts under the name of *Gorgonetta mirabilis*. Frank Long, preparator at the Museum from 1935 to 1942, enlarged the original specimen to one hundred and fifty times life size and constructed a replica in red and clear glass. The result was photographed for our cover by Clyde Hare of the Pittsburgh Photographic Library, University of Pittsburgh.

*Gorgonetta* is one of seventeen jewel-like models of big and little water animals prepared by Mr. Long and featured in the Museum's new exhibition of aquatic plants and invertebrates. All are replicas of primitive creatures close to the bottom of the zoological hierarchy.

The exhibit will recall to some visitors the elegist's famous couplet,

"Full many a gem of purest ray serene

The dark unfathomed caves of ocean  
bear. . ."

The models have in fact been mounted primarily as a study in natural design and coloration, rather than a three-dimensional biology lesson. Food for thought, notwithstanding, is here in plenty for whoever cares to discover it.

—V. G.

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# Calendar for December

## UNITED WE SING

The sixteenth Christmas Carol Festival, with 21 heritage groups numbering 650 singers taking part, will be held in Music Hall on Sunday, December 7, at 2:00 o'clock and again at 4:00. Christian hopes and fears of all lands and years, expressed in music, are met in this community program that has become part of Christmas in Pittsburgh.

The Festival is recorded for Radio Free Europe and the Voice of America and will be amplified throughout the Institute to take care of overflow audiences.

## 1952 PITTSBURGH INTERNATIONAL

The 1952 PITTSBURGH INTERNATIONAL EXHIBITION OF CONTEMPORARY PAINTING, which presents 305 paintings by 270 artists from 24 different countries, continues at the Institute until December 15. Thereafter the exhibit moves to San Francisco to be shown in the California Palace of the Legion of Honor during February, under direction of Thomas C. Howe, Jr.

## ON THE BALCONY

Seventy French, English, and American prints from the Institute collection may be seen through December and January in an exhibit entitled FINE PRINTS OF YESTERDAY.

## MADONNAS

Paintings, sculptures, and decorative arts comprising the Madonna collection of Mrs. S. Eugene Bramer have been lent for display in the Hall of Architecture from December 14 through January 11.

## ONE MAN'S PITTSBURGH

An abstractionist's view of the city recorded with a camera instead of a paintbrush offers some novel versions of familiar scenes in the current Pittsburgh Photographic Library exhibit of urban studies by Eliot Erwitt. This is the fifth in a continuing series presented by the Museum.

## LIFE UNDER WATER

Under eerie lighting in a darkened room, delicate and strangely wrought microscopic animals of ocean, lake, and river are magnified many hundreds of times in jewel-like glass reproductions. Murals of aquatic plants and animals complete this unusual new exhibit.

## MUSEUM BACKSTAGE

An inside look at Museum laboratories and studios is offered in a series of exhibits designed by staff artists and preparators, showing the tools and techniques that make the Museum. Eleven individual displays cover a wide variety including miniature animals, giant insects, glass eyes, and paper rocks.

## LIBRARY ON THE AIR

WDTV—Fridays at 10:00 A.M.

WWJW—Thursdays at 10:00 P.M.

## SUNDAY ORGAN RECITALS

Marshall Bidwell presents free organ recitals in Music Hall each Sunday afternoon from 4:00 to 5:00 o'clock, under sponsorship of the Arbuckle-Jamison Foundation.

## CARNEGIE INSTITUTE SOCIETY LECTURES

Music Hall

Admission only by

Carnegie Institute Society card

*(Only two lectures in Music Hall this month, with the series beginning again after the holidays with John H. Furbay's illustrated lecture on "The Fabulous Middle East," January 6.)*

December 2—EXPLORING PANAMA'S UNKNOWN COAST

M. W. Stirling, of the Smithsonian Institution, shows films on Panama. 6:30 and 8:30 P.M.

December 9—MYSTERIES OF THE PIPES

*(The public is invited to this program, which will be given only at 8:15 P.M.)*

Marshall Bidwell, organizer and director of music at the Institute for the past twenty years, will discuss and demonstrate unusual features of the Music Hall organ, one of the world's finest instruments. Illustrative slides will accompany his talk.

## WALKING TALKS

Tuesday evenings, 7:00 to 7:45 o'clock, beginning at the Art and Nature Shop.

Open to the public

December 2—PANOROLL

Ottmar F. von Fuchrer, Museum staff artist.

December 9—EXTENSION LABORATORY

W. LeRoy Black, supervisor of extension services.

## STORY HOUR

Pre-school story hour comes on alternate Tuesdays, December 2 and 16, at 10:30 A.M., in Boys and Girls Room at the Library, with talks for mothers at the same time.

Story hour for school-age children is Saturday at 2:00 P.M., in Boys and Girls Room.

## SATURDAY CHILDREN'S FILMS

In place of the free movies on December 6 at 1:00 P.M. will be "A Christmas Treat" in Music Hall given by drama students from Pennsylvania College for Women directed by Mrs. Jacob Evanson, under auspices of the Children's Civic Theatre Society, Inc.

Moving pictures of travel and the outdoors will be shown, as usual, at 2:30 P.M., Saturday, December 13, in Lecture Hall, but the programs will be omitted December 20 and 27.

## NEW BOOKS FOR YOUNG GIFTS

Along with the exhibit of new books suggested as holiday gifts for children currently in the Boys and Girls Room at the Library, a free folder of gift titles has been issued, arranged in the following groups: Picture Books, Fun and Fancy, For Ages 8-12, For Older Girls, For Older Boys, For the Unusual Reader, Famous People, and If You Want To Know. These are obtainable at the Library.

## WORLDS UNDER WATER

Following a visit to the Museum's new installation, LIFE UNDER WATER, the Tam O'Shanter and Palettes used paints and pastels to portray their ideas of beautiful and interesting worlds under water. These pictures, each of which is the work of one morning, are currently on view at the Museum.

# Favorite foods

## FROM FOREIGN LANDS . . .

**VARIETY** is the keynote of the Scandinavian smorgasbord. Smorgasbord had its roots in the pagan feasts of the Vikings. For when those adventurous Norsemen banqueted in their cavernous halls, the tables groaned with the weight of roasted ox and deer, succulent hens and pungently sauced and salted fish.

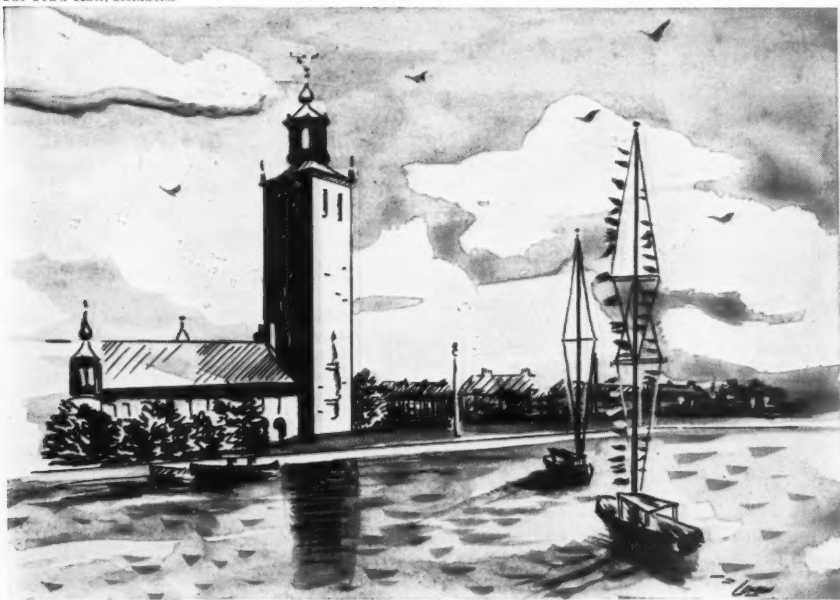
● Women took over the kitchens in the sixteenth century; gradually flavors and service reflected their refinement, and an endless procession of new foods began. When families and friends gathered—for weddings, christenings, holidays—tables were heaped with good things to eat. Each housewife brought her "special" dish, proudly displayed it on a long buffet from which guests, plates in hand, would choose their favorites.

● For today's informal entertaining, smorgasbord is ideal. And when you enlist the Heinz 57 Varieties, your table is almost complete. There are crisp pickles, richly sauced spaghetti, macaroni and beans, sparkling jellies and condiments for fish and meats. Use them just as they come from bottle or can or in tempting combination with other foods.

H. J. HEINZ COMPANY



*The Town Hall, Stockholm*



## WE MEET GUIGNOL, NOTED PARISIAN

MARGERY EVERNDEN



ABOVE the famous pink stuccoed puppet theatre in the Jardin du Luxembourg runs the legend, "*Pour les enfants et les gens d'esprit.*" The legend does not boast.

Parisians of all ages cherish, in memory at least, that undaunted little actor of their marionette stage—the marvelously lively, marvelously Gallic Guignol. And not Parisians alone.

No less noted a representative of *les gens d'esprit* than the novelist Katherine Anne Porter ended a recent essay with the announcement, "When I finish this, I am going to the Luxembourg to see the puppet show. It is just as delightful as it was when I lived in Paris before."

For four Americans in Paris this year—two eager small girls and their equally eager parents—Guignol was not an old friend, as he was for Miss Porter. He was instead a fresh discovery and, very soon, an infatuation.

We watched him wielding his indomitable baton and blithely swinging his long black queue on the well-equipped stage at the Luxembourg. We followed him to the canvas-walled theater in the Tuilleries. And on late Sunday afternoons, when the clangor of passing trains and the voices of strolling Parisians blended with the play, we paid our forty francs to a stout, wise-eyed lady in frugal black and sat beneath the open sky in the Parc de Montsouris to see him meet still further adventures.

If we had been fortunate, we might have seen him, too, on the Champs Elysées, in the Square du Saint Lambert, at Ranelagh, and elsewhere.

In a century and a half of checkered existence this impudent puppet has become a kind of folk hero. The guide books call him a French "Punch." The learned volumes in the Bibliothèque de l'Arsenal, that

remarkable library of all the arts, say that his lineage can be traced from the Roman Maccus with his hunchback and crooked nose, from the famous seventeenth century Polichinelle, from Harlequin and Pierrot.

If Guignol himself ever discussed these matters, he would surely be impatient with such imputations. Punch, indeed! That long-beaked scion of John Bull! He himself is as Gallic as Camembert cheese or a bottle of good red wine. With his disdain for titles and authority he would hardly wish to claim more kinship with the foppish fellows who performed on the fashionable marionette stages in the chateaux of the French nobility.

Guignol was created by a silk weaver of Lyons in the hard days following the Revolution. Born in 1769, Laurent Mourguet was a man so poorly educated that it is thought he could not even write. His connection with the traditional world of the theater was nonexistent. Father of ten children, he was by turns and of necessity a weaver, peddler, extractor of teeth.

It was to attract passersby to his wares—and to his forceps—that he first set up, toward the turn of the century, a modest puppet stage, a *casteler*. Happily the experiment proved successful enough to enable him by about 1805 to desert both

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Margery Evernden, a University of California graduate, has written articles and stories for national magazines and five books for children, of which the most recent is *The Golden Trail*, published last spring by Random House. The wife of a Westinghouse research chemist, Earl Gulbrandsen, she and her small daughters enjoyed the Guignol shows in the Tuilleries, the Luxembourg Garden and the Parc de Montsouris while visiting Paris early this year.

Miss Evernden reports that she was allowed to use books on the history of Guignol in the Bibliothèque de l'Arsenal because she could present her Carnegie Library of Pittsburgh card—thus proving she was a trustworthy person!





GUIGNOL FASCINATES ALMOST EVERYONE

peddling and dentistry and to devote the rest of a busy, never easy life to creating adventures for a jaunty puppet character whom he probably first presented at the Parc Chinois and whom he named Guignol.

To the *canuts*, the silk-weavers of Lyons, with their hard work day of fifteen hours and their scanty meals of bread, soup and sausage, Guignol brought relaxation and delight precisely because he was so much like themselves. He spoke the *canut* dialect. He meant well, but he was always in debt. He mocked the respectable and comfortable, the fat bourgeois, the frizzy marquise, the pompous gendarme. Occasionally he even beat his wife! Yet in the end he dealt out more real justice with his absurd, chopstick-like batons than a squad of police with all their arms. And always, everywhere, in any predicament he laughed.

It was this Guignol, first created by Mourguet, who was adopted by other puppeteers, among them Mourguet's own children, and brought in time from Lyons to Paris.

The saucy fellow's rough edges were gradually worn off, his sins modified for an increasingly juvenile audience. But, emasculated as in a sense he was, he still wore and wears today the traditional Guignol costume, the snug black cap and bobbing queue, the green jacket and the eighteenth-century coat, color of wine dregs. He wears the familiar face, beady black eyes, round

nose, mocking mouth. He remains the unfortunate, unregenerate fellow with the heart of gold.

It is surely for his naughtiness that the French children love him. How could they applaud so vigorously and so sibilantly for a figure of dull virtue? Surely they would not shout to him, as they do, their greetings, warnings, and advice.

"Audience participation" is no lifeless theory in the *casteleers*. Guignol himself demands participation. "*Applaudissez fort!*" The children do not need his admonition to applaud loudly.

Certainly his adventures are colorful enough to attract any youthful audience. He does not merely invade the cellars of ancient chateaux and truss up the robbers who would kidnap the marquis' lovely daughter. He does not only lick up at a single sitting sixty-four jars of the marquis's *confitures*.

He journeys also to America to meet the Red Indians. He crosses Saharan sands to help his master pursue rare butterflies. He even rises to the moon in a barrel with a parasol above his head.

Everywhere he is engaged in the sort of antics dear to childhood. Treasures and villains alike appear and disappear when his back is turned. Small, enchanting birds and animals, scurrying rabbits and mice, attend him. Fearsome baboons attack him, crocodiles defend him. To the sound of off-stage cymbals he bumps his wooden head

vigorously a dozen times per play.

His adventures, traditional and modern, must by now number in the hundreds.

Yet, heart though he may be of the Parisian puppet world, Guignol is not the only hero shown by present-day performers.

Quite apart from marionette artists who experiment for a more limited audience in the most modern idiom, dozens of familiar stories are presented upon the *castelet* stages. The *grands galas* of holiday weeks celebrate the adventures of Robinson Crusoe, Perrault's *Petit Poucet*, Little Red Riding Hood and many another.

Unlike the simple plays of ordinary Thursday and Sunday afternoons, these elaborate puppet dramas are lavish with bright costumes, music and ballets. A half dozen puppets in eighteenth-century wigs and silks may dance a studied minuet. Terrible among the diminutive cast, a real live actor may play the ogre who spears his wife's top-knot with a toasting fork, rejects carrots and potatoes and demands small roasted boy for dinner!

They are true bargains in theater, these *grands galas* which last for an hour and cost sixty or seventy francs—about twenty cents!—per ticket.

It is of interest that these are hand puppets—*Marionettes à gaine*. The marionette with strings is, according to the Guignol partisan, too far removed from his manipulator, too unresponsive to his mood and emotion. Pierre Neichthausen, an inheritor of the old Lyons tradition, has said that one quarter of his gift as a performer is in having a good *canut* accent, one quarter in having a very flexible voice, but at least one half in having emotion in his fingers!

There are exacting exercises for training the puppet master's hands. Some of the techniques for obtaining special effects are written down for any puppeteer to learn. Others are jealously guarded secrets. It is said to be against the code of a professional to watch another puppeteer at work in his *castelet*. A father may refuse to cross the stage of his own son until he has been granted permission.

These men must be swift and deft. A *grand gala* may demand four or five performers, but frequently a single puppeteer must manipulate every character in a twenty-minute show. It is one of the

virtues of the Lyons *gaine*—for there are several types—that the puppet can be easily slipped on or off the hand. Suspended on some ingenious hook or shelf behind the scenes, each puppet actor awaits his turn upon the stage and, when that turn comes, leaps quickly into life.

During this century and a half of adventures Guignol has known vicissitudes both on and off the stage. In the days of Napoleon his politics were suspect and his plays were required to be written down to be read beforehand by the censor, though they might be modified in production.

Fire and debt have brought their own tragedies. Mourguet himself in his old age lost a *castelet* to flames in Vienna, where he went to spend his last years.

War, too, has left its scars. In World War II some valuable collections of puppets were scattered. The Théâtre du Luxembourg with its excellent equipment was badly damaged, since it was in the Luxembourg that the Germans made one of their last stands in the battle for the liberation of Paris.

Yet that damage has been repaired. Between acts children eat "Esquimaux"—chocolate-coated ice cream—and candy as blithely as though no bullets ever sang through the stuccoed walls. The theater of the Square du Saint Lambert is today said to own three hundred stage décors, some old, and eight hundred costumes.

As one of his admirers has written, Guignol today as always "laughs at everything, for he has that sane philosophy which makes him think that everything works out more or less badly—but everything does work out, and nothing can take away his good humor."

It is for this good humor that one forgives him anything.

We who are among Guignol's recent friends hope and expect to visit him again if fortune brings us once more to Paris. We know we shall hear the same note of Gallic laughter and defiance in his falsetto voice as he leans across the narrow *castelet* stage and pipes to us a mocking welcome, "*Bonjour, mes petits éléphants*. Hello, little grasshoppers. *Ab, non, non, non! Bonjour, mes chers enfants!*"

Until that day we say to him from across the sea—as he himself might end a play—"Au r'voir et merci."





Joseph E. Harsky

SOME OF THE CAROLERS AT THE INTERCULTURAL FESTIVAL IN MUSIC HALL

## OUR INTERHERITAGE CHRISTMAS FESTIVAL

THE sixteenth "United We Sing" Christmas Carol Festival will be held this year on Sunday afternoon, December 7, in Carnegie Music Hall. Every year more people want to experience this unique program, and accordingly two presentations have to be given—one at 2:00 and the other at 4:00 o'clock. Doors open a half hour before each program.

Twenty-one heritage choruses sing traditional Christmas songs, most of these in the language of their origin, and community singing of favorite carols is led by Marshall Bidwell. The musical program reaches a climax in volume when the six hundred and fifty voices of the massed choirs, accompanied by Howard Ralston at the organ, peal forth the Hallelujah Chorus. But inevitably the Festival's most impressive moments are when the lovely descant of girl sopranos floats from the second gallery over the hushed or even hummed strains of *Silent Night*.

"United We Sing," springing as it does from the deeply cherished traditions of Pittsburgh's many-heritaged Americans,

discovers fresh possibilities of growth every year. Participants learn that the more they share their Christmas traditions, the more they enjoy and value them. They get a new and poignant realization of what the age-old Christmas message of "Glory to God in the highest, and on earth peace, good will toward men" means to free Americans.

From the very beginning some choirs came to the Festival in the brilliant costumes of their ancestors. That custom grew until now all the eight or ten choirs on the stage appear as a rainbow pattern. Many other choirs wear their varicolored vestments or, in several instances, school uniforms. Ushers with jeweled headdresses, delicate laces, and rich embroidery, grace the boxes beside the proscenium. Could Tech's Bagpipers parade in any but plaids?

Really in a Festival such as "United We Sing" pageantry in a latent form has always been present, yet not until year before last did the members of the Junior League, representing our American Colonial heritage, bring in their evergreen

garlands for the adorning of the stage during the singing of *Deck the Halls*. And not until last year was a Christmas tree installed at each side of the stage, these to receive their ornaments as they were brought in dignified succession by clearly identifiable representatives of each singing group. Thus was instituted the "Pageant of the Tree," which again this year will enhance the appeal of the program.

Until this year, all the choirs have been composed, with few exceptions, of American-born members of our country's varied cultural strains. This year, however, for the first time, one almost totally foreign-born chorus will join us. Among the flow of refugees from Europe during these latter years, Pittsburgh has been welcoming a number of Ukrainians who have only recently realized their hope of making America their home. Thirty of these have managed, despite all odds, to organize their own chorus, and will appear in the characteristic dress of their native land.

The Festival is co-ordinated by Mrs. Samuel Ely Eliot. After the second performance the singers proceed across Forbes Street to the basement of Stephen Foster Memorial Hall. There they are served refreshments as guests of the University and the Tuesday Musical Club.

The twenty-one musical groups taking part in the Festival are the following, the heritage they represent in parentheses:

ST. NICHOLAS CHURCH MALE CHORUS OF  
WILMERDING  
(Bulgarian)  
Evan Georgieff, director  
PROVIDENT MISSION SINGERS  
Bamboo flute accompaniment  
by Gwendolyn Lewis  
(Chinese)  
Mabel Voelzke  
SCHENLEY HIGH SCHOOL A CAPELLA CHOIR  
(English)  
W. Howard Keister  
WINCHESTER-THURSTON SINGERS  
(French)  
Selma Brandt Kress  
MELLON INSTITUTE CHORUS  
(German)  
Paul W. Koch  
ST. PETER'S ROMAN CATHOLIC BOYS CHOIR  
(Italian)  
Anne Uhler

ELIZABETH SETON HIGH SCHOOL GLEE CLUB  
Irish harp accompaniment  
by Grace Weymer Follet  
(Irish)  
Sister Cecilia S.C.  
ST. MARY OF THE MOUNT POLYPHONIC  
SINGERS  
(Latin)  
Sister M. Ina, I.H.M.  
ST. FRANCIS ACADEMY CHOIR  
(Lithuanian)  
Sister M. Francesca, O.S.F.  
FIRST MAGYAR REFORMED CHURCH CHOIR,  
HAZELWOOD  
(Magyar)  
Antonia Yuhasz Harangi  
WESTMINSTER CHOIR, BIDWELL PRESBY-  
TERIAN CHURCH  
(Negro)  
Elizabeth Harp Percy  
FRICK JUNIOR CHORUS  
(Norwegian)  
Marjorie Eloise Sweet  
POLISH FALCON SOCIETY  
(Polish)  
Henry Grzeskiewicz  
HOMESTEAD RUSSIAN ORTHODOX MALE  
CHOIR  
(Russian)  
Andrew Kalupnon  
CARNEGIE TECH BAGPIPERS  
(Scotch)  
Lewis W. Davidson  
PHILIP VISNICH CHOIR  
(Serbian)  
Boris Dobrovolsky  
ST. GABRIEL'S ROMAN CATHOLIC SCHOOL  
(Slovak)  
Sister M. Bernard, O.S.F.  
PRESEREN SINGING AND CULTURAL SO-  
CIETY  
(Slovenian)  
Boris Dobrovolsky  
CHERWONA KOLYNA (MOUNTAIN ASH)  
CHORUS  
(Ukrainian)  
Isidore Lukowski  
SEXTETTE  
(Welsh)  
Carolyn Hunt Mahaffey  
BRASS ENSEMBLE, WESTINGHOUSE HIGH  
SCHOOL  
Carl McVicker

## SOCIETY BEGINS UNDER WATER

VAUGHAN GARWOOD



A SCIENTIST, according to one type of layman, is a professional hairsplitter who makes a career of finding out more and more about less and less. Although the scientist is usually too busy to argue the point, now and then he gets even by confronting the layman with some spectacular disclosure of the infinitesimal, as in the new Museum exhibit called "Life Under Water."

The central feature of the show is a room within a room, totally dark except where light from an occult source falls on fragile and fantastic shapes that appear to float through a black abyss. These might well be attributed to Salvador Dali in collaboration with Tiffany or Cartier. Actually they were designed by Nature, discovered by a man with a microscope, and reproduced after hundreds of magnifications by a virtuoso in the art of blowing glass. Each represents a species of water animal still living today, but so primitive that it forces the imagination back to the time when life was an experiment newly launched in the shallow waters of the earth.

You can go all the way back to the shadowy borderline between the plant and animal kingdoms by examining the models of protozoans on the outer wall of the darkroom. Designated according to a rather arbitrary classification as the earliest form of animal life, these one-celled creatures differ only minutely from those the biologist calls plants. In the beginning both were traveling food factories that used sunlight to turn inorganic stuff into nutrition. Presently one group settled down to a static life sustained by photosynthesis, while the other lost its chlorophyll but contrived to make a living by keeping on the move and consuming as food the photosynthesists themselves.

If their original ancestors were such insignificant blobs of protoplasm, how did animals ever work their way up to fins and feathers and fur and frontal lobes?

One visible clue to the possibilities in-

herent in a single living cell is provided by the current display of some forty protozoans selected from among countless thousands, no two alike. What the exhibit does not show is that even these lowly creatures have the power to increase their racial vigor and variability through the exchange of inherited traits between individuals. At the protozoan level where reproduction is merely a matter of splitting in half, nothing more is involved than merger, reshuffling of genes, and separation. At a higher level the mechanism is known as sex and the complications defy analysis. At any level this is the laboratory of evolution, the means whereby living things change with a changing world.

So much for the one-celled animal on its own. Cross the threshold again into the darkroom, and you find Nature beginning to build society.

A good example of the first stage in social organization is the cluster of long club-shaped blue cells called *Synura uvella*. These cells are individual animals, alike in form and function but living together in a community. Such groupings of identical cells originated when the two new individuals produced by the splitting of one protozoan stayed joined instead of separating, and from habitual association developed a colonial way of life. The same stage is represented by the spiky green *Anthophysa* and the colorless *Dendromonas*, also on exhibit in the darkroom, and in a separate case outside by the beautifully symmetrical *Salpingoeca amphoridium* that looks as if it had come off the drafting

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As staff writer at the Museum, Miss Garwood helps scientists translate biological terminology into lay English. Preparation for the job included an undergraduate major in Romance languages and two government assignments, one as translator in Washington during the thirties, the other in wartime London writing articles for publication in France, Germany, Yugoslavia, Norway and The Netherlands. A victim of congenital logophilia, she is liable at any time to come down with a mild case of Welsh or Yiddish, but currently shows symptoms pointing toward a severe attack of scientific Latin.

table of some mechanical engineer.

Thus far each cell is still an individual in the sense that it carries on every vital activity of an organism and could get along all right by itself. Now consider the second stage in social organization, the division of labor.

Suppose one of the flagellate or whip-bearing protozoans formed so large a colony that the individuals were many layers deep. Then presumably the whiplash swimming device would be of most use among the outer layers. Individuals near the center, on the other hand, might be better situated to perform functions like reproduction. With due allowance for oversimplifying, it may be imagined that under some such pressure of expediency cells began their blind unconscious progress toward specialization. Eventually every activity necessary to life was being carried out on behalf of the whole colony by a particular group of specially adapted cells. The end result was something new in the animal world—a complex individual made up of many differentiated and interdependent cells which a few generations earlier would have been individuals in their own right.

Here again, as in trying to separate plants from animals at the lower end of the evolutionary scale, a clean sharp line is hard to draw. Colony-making is done by multicellular animals as well as protozoans, but the difference between a complex colony and a complex individual is still mooted even among biologists. If you are fortunate enough to be on cordial terms with one who specializes in taxonomy, get him to give you his own views on the question. If not, take the distinction for granted and see how the division of labor works out in one of the marine animals technically classed as colonial. The Indian Ocean jellyfish *Epibulia ritteriana* is an assemblage of variegated members suspended from a large swim-bladder. Elongated tactile members with crimson eyespots serve as the reconnaissance corps of the colony; stinging tentacles capture live prey and pass it on to the funnel-shaped food processors; reproduction is carried out by the centrally-placed male and female members. A larger jellyfish that leads much the same kind of life on an individual instead of a colonial basis is the Portu-



FLOATING JELLYFISH *CANNOPHYSA MURRAYANA*

guese Man-of-War, a formidable foe in the water even for human beings. The one on exhibit has tentacles that can be measured in inches, but a live specimen may surprise you by landing a powerful punch from twenty feet away, as many veterans who have seen service in tropical waters will recall to their chagrin.

From this point upward in the animal kingdom, the complex individual is the unit Nature uses to build societies. Heretofore, contact has been the cement that held the units together. Now the structure becomes flexible almost to infinity as individuals develop other modes of association.

The closer they are bound to one another by mutual dependence, the more individuals differ in form and function. Insects owe much of their perennial fascination for the human race to the extremes they have attained in this direction. One species of ant has developed a sterile caste of doorkeepers with enlarged heads used principally if not exclusively for closing entrances against invaders, while a certain termite queen lays one egg every second during the entire thirty years of her life span, not even taking time out for lunch.

Although examples could be multiplied indefinitely, it might be more edifying to



Photos by Pittsburgh Photographic Library

CAMPANULINA TENUIS—THE THIRD STAGE IN COLONY-MAKING

consider the effect these specialists in specialization have had upon the human beings who study them. Here you find a wide range of variables with only one constant. No sooner does a man observe the intricacy of organization among insect societies than he begins comparing them with his own.

Solomon, a celebrated savant in another day and age, has enjoyed so august a reputation in ours that he is entitled to the first word. "Go to the ant, thou sluggard," he urges with the air of one who will stand for no nonsense. "Consider her ways, and be wise: Which having no guide, overseer, or ruler, provideth her meat in the summer, and gathereth her food in the harvest."

Excellent, most venerable majesty. Fine, so long as "food in the harvest" is the shining goal of human endeavor. But what is to happen thirty or forty centuries later, when the machines man devises as an extension of his own hand and brain have brought abundance within his reach at the imminent cost of a subspecies developed on purpose to tend them? In a novel that chilled a few spines and tickled many funnybones, a biologist of our own generation described a human society modeled on those of the insects, with special castes conditioned from birth for unskilled labor, white-collar work, and statesmanship respectively. Meanwhile, mankind has actu-

ally undertaken more than one real-life experiment in social organization tending toward the rigid efficiency of the anthill.

Whenever the analogy becomes uncomfortable, we can dismiss it as far-fetched in the first place. Insects and other highly socialized creatures have developed along lines too divergent from our own to bear protracted comparison. Yet the question of how society will evolve henceforward still comes home to the species that raised it. The others have given up their plasticity in exchange for specialization. It is to us, after

all, that the animal kingdom must look for the next variation on a theme introduced two billion years ago, under water.

Fortunately for the trustees of this embarrassing responsibility, Nature has left records of all her major experiments in animal evolution. Some of the forms that emerged from primeval chaos have sent their germ plasm down through the ages to our own time without ever reaching a dead end. Some promising products of evolution, like the giant reptiles of the Mesozoic, have attained mastery over all creation only to fail the crucial test and disappear forever, survived by poor relations that knew how to roll with the punches. To draw working hypotheses from such evidence is the unique prerogative of our species and the *raison d'être* of a museum maintained by and for the creature with the thinking brain.

## MAGAZINE HONOR

CARNEGIE MAGAZINE is included among 109 publications of large and small circulation in the third annual Magazine Show sponsored by The American Institute of Graphic Arts. The exhibit closed recently in the organization's new quarters at 13 East 67th Street, New York City, and is now on tour. The MAGAZINE, printed by Carnegie Institute Press, was cited for excellence in typography and lettering and in printing craftsmanship.



## THE RELIGION OF THE MOSLEMS

FRANK DIXON McCLOY, JR.

MAKE mention in the Book of Mary, when she went apart from her family eastward, and took a veil to shroud herself from them, and we sent our spirit to her, and he took before her the form of a perfect man. She said, "I fly for refuge from thee to the God of Mercy: if thou fearest him." He said, "I am only a messenger of the Lord, that I may bestow upon thee a holy son." She said, "How shall I have a son when man hath never touched me? and I am not unchaste?" He said, "So shall it be. Thy Lord hath said, Easy is this with me, and we will make him a sign to mankind and a mercy from me: for it is a thing decreed." And she conceived him and retired with him to a far-off place. And the throes came upon her by the trunk of a palm. She said, "Oh, would that I had died ere this, and been a thing forgotten, forgotten quite." And one cried to her from below her, "Grieve not thou." Then came she with her babe to her people, bearing him. They said, "Oh, Mary, now hast thou done a strange thing, O sister of Aaron. Thy father was not a man of wickedness nor unchaste thy mother." And she made a sign to them, pointing toward the babe. They said, "How shall we speak with him who is in the cradle, an infant?" (The babe) said, "Verily, I am the servant of God: He hath given me the Book (i.e. the Gospel) and He hath made me a prophet.

SUCH is the version of the Christmas story as it finally came to rest in the Scriptures of the Mohammedans, some six hundred years after the event it describes. The man who told it as a part of his strange, irruptive revelations had traveled as a youth from pagan Arabia to Christian Syria with commercial caravans and had listened to the preaching of hermit priests. He heard a distorted and padded recounting of the Annunciation, made so by the pressures and upheavals of the Eastern church theologians and the uncurbed imaginings of storytellers. He evidently did not himself read the Gospels of the Christians, but caught fragments of sermons and apocryphal legends about Jesus, and let them sink into the churning turmoil of his own religious awakening. When, finally, back home in Arabia, he could no longer contain the burden of his heart, he poured out all in a series of utterances of such burning power and passion that an entire people were melted and remolded into what we know as Islam. And where once he stood,

a silent, meditative hearer of the homily of a Syrian monk amid a people whose Christianity was broken and enfeebled by doctrinal division, his own disciples within a century returned triumphant with Koran and sword and one clear, ringing creed, "There is no God but Allah, and Mohammed is His prophet."

Mohammed was of no particular consequence for the first forty years of his life. He belonged to one of the lesser noble families of Mecca. He married a widow older than he who was wealthy, and it was in her interests that he became a commercial traveler. He not only became acquainted with Christians abroad, but also with Jews, a colony of whom lived in Mecca. He heard about the heroes of the Old Testament, especially Abraham, and he heard the great cry of Judaism, "Hear O Israel, the Lord thy God is one God." All about him however was the chaos of Arabian paganism: gods everywhere, in trees, in springs, in stones. But within him was growing with inescapable compulsion





MOHAMMED AND THE ANGEL GABRIEL  
 Arabic No. 20, University Library, Edinburgh  
 As reproduced in *Histoire Générale des Religions*

the consciousness that there was but one God, a God who would speak again as He had spoken to Abraham and Moses and Jesus. And Mohammed, finally, forty years old, threw down his account book and went out into the wilderness to hear what God would say.

"A prophet is not without honor, save in his own country." Whether Mohammed ever heard this sad truth in his associations with the Christians, we do not know. But we do know he experienced it. He returned from the wilderness to prophesy for Allah (God), and his own received him not. There was a momentary flush of enthusiasm, but when his monotheism struck at the interests of men who depended on the revenues from local shrines, it turned into relentless fury.

But it was too late. A few were won

over. And in the history of religions, a few converts make all the difference in the world. The masses of popular feeling, spear-headed by maddened business men, blocked every move of Mohammed and his handful of followers. There was no recourse except flight. And a little, ragged party of men, hated and hunted, set out for the city of Medina to start afresh their task of declaring the oneness of Allah and his judgment upon mankind. This flight—called the *hejira*—across the hot wastes of Arabia, an infinitesimal scratch on the immensities of time and space, is for 250 millions of people now living the beginning of Time, just as Mecca, the birthplace of the prophet, is the center of space.

One stands in awe of the sheer mystery of this tiny flurry of activity which in the centuries to follow swept into a mighty whirlwind and to this day cuts a wide swath around the world. What is the secret? You search the Koran, which contains the revelations of Mohammed; it is not there. You visit the Mosque of Omar in Damascus with its silver filagree lamps and hundreds of glowing prayer rugs, or

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Mr. McCloy has been on the faculty of Western Theological Seminary since 1944, where he teaches Greek and serves as librarian and dean. A graduate of the University of Pittsburgh, he took his B.D. degree at the Seminary and an M.A. in the history of religion at Harvard.

the Blue Mosque in Istanbul which is like some legendary cave of the azure sea; you read the *Arabian Nights* and study the Crusades and sit half the night through foolishly arguing with polished, dexterous Moslem students. Your initial question rises a hundredfold.

At heart Islam is a faith in the overwhelming reality of a personal God and man's creaturely dependence upon Him. God has a deep concern for man and speaks to him periodically through chosen human prophets. The last and greatest of these was the man of Mecca. The revelation to him was read out by the angel Gabriel from the heavenly book. The Koran in the hands of a Moslem today is but the shadow of this eternal substance. Life for him is not the calmly reasoned Greek ideal of harmony. He reads the Koran, he prays five times daily to Mecca, he observes the fast of Ramadan, he crowns this earthly course with a holy pilgrimage to Mecca. These are the regularities of life. As for the remainder, there is only a series of events hurtling down upon man, unpredictable and unescapable, until death comes to be followed by a resurrection and a last judgment. One feels, in this religion, the terrifying, austere force of the vast expanses of Arabia; the sudden almost articulate descent of the starry night sky, cold and immediate, after the burning sun of the day. Above it and around it is—the Presence, Allah. And under the inverted bowl of these eternities, microscopic man plods his way across the desert watched by the circling hawks of Allah's will.

### *Migratory Words*

WHEN IS A CRAYFISH A CRAWFISH?

A CRAYFISH is always a crawfish, and vice versa. Either term is correct though misleading, as a crustacean is not a fish. Both represent an English failure to cope with the French word *écrevisse*, which in turn disguises the original German *Krebs* (crab).

Two usages current only on this side of the Atlantic are "crawdad," a variant from south of the Mason and Dixon Line, and the admirable verb "crawfish" meaning "back out" (of a contract or undertaking).

—V. G.



MADONNA AND CHILD WITH ANGELS

Attributed by Raimond Van Marle to Pier Francesco Fiorentino (1444-97) and to the Pseudo-Pier Francesco Fiorentino by Bernard Berenson

## MADONNAS

THE Madonna Collection of Mrs. S. Eugene Bramer is being exhibited as a Christmas show during the coming holiday season. It will be open to the public on December 14 and will close January 11. Visitors will find this delightful group of paintings, sculptures, and decorative arts in the Hall of Architecture.

French, Italian, and Spanish Madonnas, both carved and painted, have been collected by Mrs. Bramer over a period of many years. They are mainly of the late medieval and early renaissance periods, and they will be shown together with furniture, candlesticks and other ornaments of approximately the same time.

A stained glass window borrowed from the Hunt Studios will be used as part of the setting. The subject of this window is the Frideswide Abbess (died 735 A.D.). It was designed by C. E. W. Morris of Hunt Studios.

## BLUEPRINT FOR THE FUTURE

THE UNKNOWN AT HOME, Carnegie Museum's annual report for 1951, was built around the map of the Museum's primary exploration area drawn by Staff Artist Clifford J. Morrow, Jr., which is reproduced on the next two pages. Dots, dashes, and stars outline the geographical extent of six major research studies undertaken in the area during the first fifty-four years.

Originating as long ago as 1898 and as recently as 1951, these studies represent important links in the chain that connects man with other living things. Two of the six have been completed; the remainder are scheduled for completion within the next few years. Following is a brief summary of their purpose, progress, and present status, in the order of initiation.

*Birds of Western Pennsylvania*, published in 1940 by the University of Pittsburgh Press under a grant from The Buhl Foundation, is the source book for all present and future students of our local avifauna. The author, W. E. Clyde Todd, has been with the Museum since 1899, continuing the bird studies he began during his early years in Beaver County.

*Wildflowers of Western Pennsylvania and the Upper Ohio Basin* represents a collaboration between the late Director Emeritus Andrey Avinoff and Director Emeritus O. E. Jennings. Shortly before his untimely death Dr. Avinoff prepared over two hundred life-size watercolor paintings to illustrate Dr. Jennings' text, which covers a lifetime study of tri-state flora. Publication by Carnegie Museum and the University of Pittsburgh Press, under a grant from The Buhl Foundation, is scheduled for 1953.

Volume 33 of the Museum *Annals* opened with two papers published simultaneously last September under the title *Fossil Vertebrates of the Tri-State Area*. This study is based on remains of Coal Age fishes, amphibians, and reptiles collected by the Museum during the 1930s in thirty-seven

localities extending southwest of Pittsburgh into Ohio and West Virginia, and including many never previously known as fossil sites. William E. Moran devotes the first article to the location and stratigraphy of the sites, while Alfred S. Romer discusses the fossils themselves in the second.

In 1946 the Museum and the Pennsylvania Game Commission began the Survey of Pennsylvania Mammals, carried out as six Pittman-Robertson projects in co-operation with the U. S. Fish and Wildlife Service. A comprehensive book based on five years' field work is now in preparation.

The Upper Ohio Valley Archeological Survey, launched in 1950 with the generous support of the Sarah Mellon Scaife Foundation, is the first large-scale study ever made of the people who lived in this area before the coming of the white man. The results of three years' intensive work will be incorporated in a detailed report, to be published in 1953, entitled *An Introduction to the Archeology of the Upper Ohio Valley*.

Another long-needed study made possible by a grant from the Sarah Mellon Scaife Foundation is the Pennsylvania Herpetological Survey, begun in 1951. This will provide the basis for a book on the state's amphibians and reptiles, to be written after field work has been completed some time next year.

These projects, together with other regional studies more limited in scope, have brought the Museum a long way toward its founders' ambitious goal of a complete biological survey spanning the whole Appalachian region. The record thus far shows the achievements of staff sections operating as separate units; it remains to be seen what they could accomplish by working together from start to finish on a combined research problem. Between the lines on the map but discernible to Museum eyes is a blueprint for the future.

—VAUGHAN GARWOOD

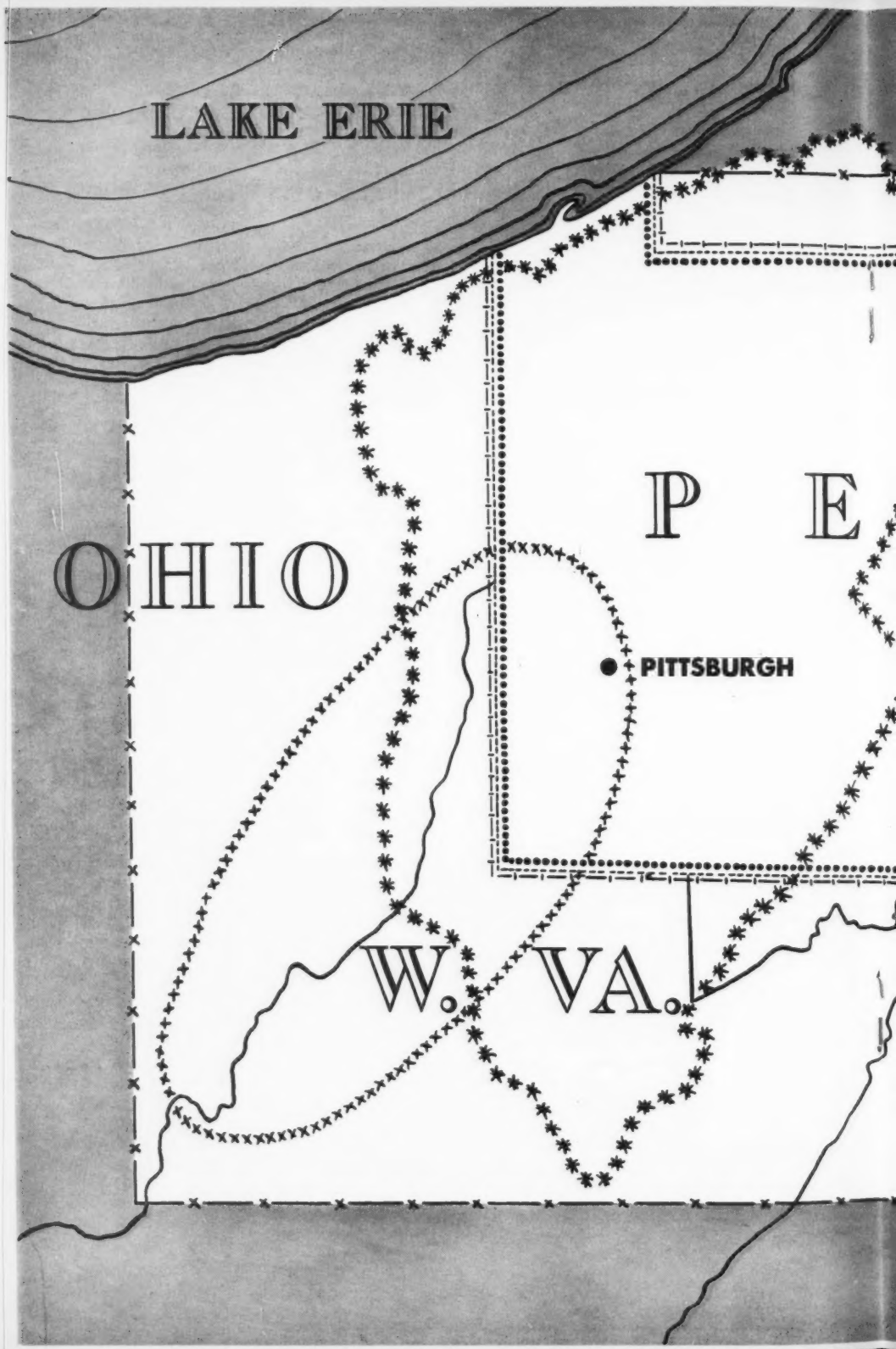
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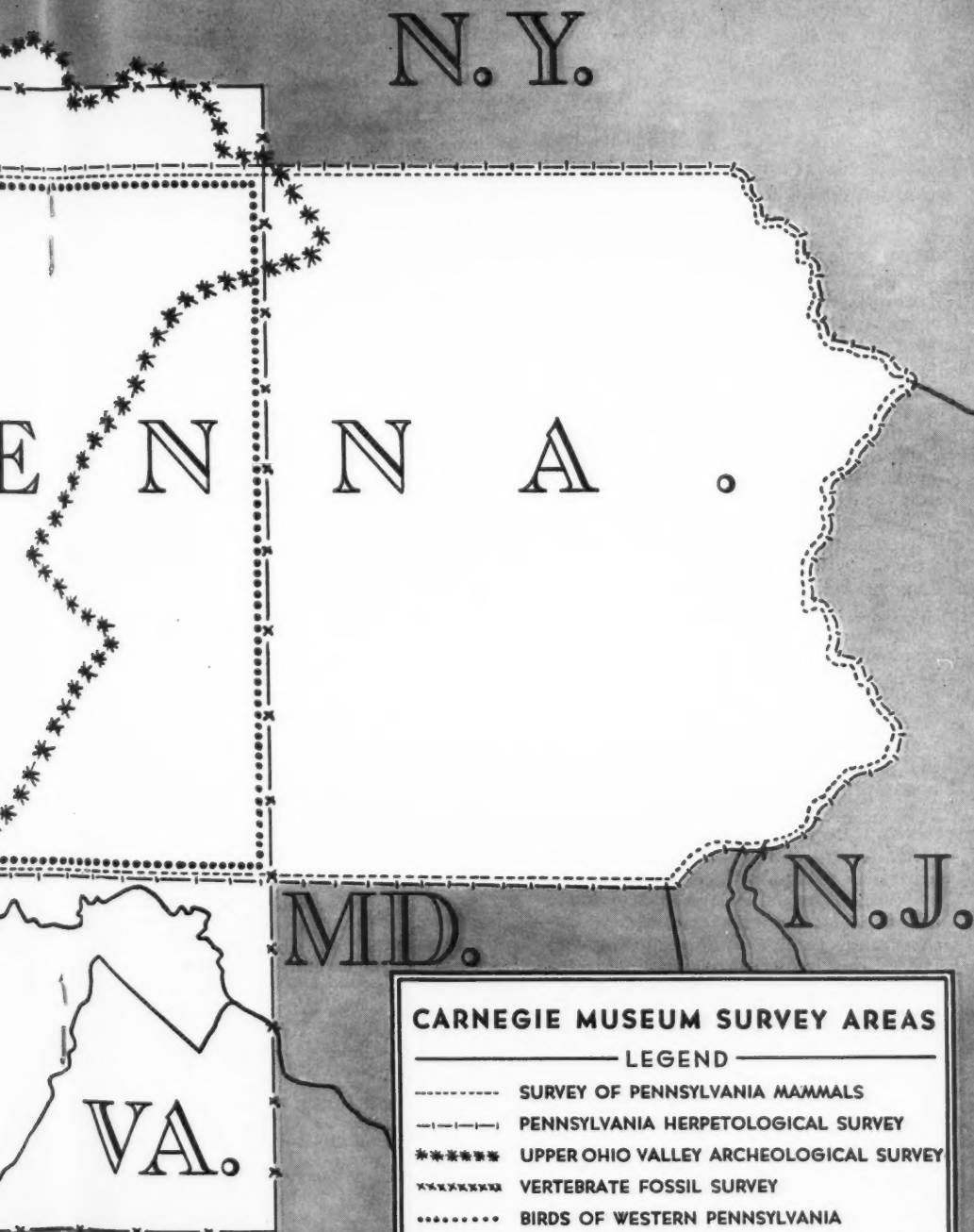
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### CARNEGIE MUSEUM SURVEY AREAS

#### — LEGEND —

- SURVEY OF PENNSYLVANIA MAMMALS
- · - · - · - PENNSYLVANIA HERPETOLOGICAL SURVEY
- \*\*\*\*\* UPPER OHIO VALLEY ARCHEOLOGICAL SURVEY
- xxxxxxx VERTEBRATE FOSSIL SURVEY
- ..... BIRDS OF WESTERN PENNSYLVANIA
- x - x - WILDFLOWERS OF WESTERN PENNSYLVANIA  
AND THE UPPER OHIO VALLEY



# LEONARDO DA VINCI

1452-1952

ALBERT R. GOLDSMITH



THROUGHOUT 1952 virtually every learned society has honored the five-hundredth anniversary of Leonardo da Vinci's birth. Congresses met at Milan, Venice, and Paris. Simultaneous celebrations were held at places where he worked, including Amboise, where he spent his last years, as well as in the New World, where his influence was indirect but fully recognized. This summer at Norwalk, Connecticut, a collection of reproductions of drawings and paintings was shown, together with the Guatelli scale models of Leonardo's mechanical inventions that were seen two years ago at our Buhl Planetarium; while major exhibits of his art have been held at the Louvre, at London's Royal Academy, and at the Laurentian Library in Florence.

Special tours retraced his travels; other countries issued commemorative postage stamps; numerous biographical accounts, a few with new information, came to light; Bolognese scholars uncovered some sixteenth-century documents relating to Leonardo; and thousands of manuscripts in his characteristic mirror-writing have been gone over again.

Principal emphasis has been that his mechanical and scientific investigations directly foreshadowed later inventions: for example, Leonardo's devised flyer spindle and the modern textile winder. On the other hand, one recent monograph disputes the claim that Leonardo comprehended the circulation of the blood. Each article, however, in some way exalts Leonardo's greatness as artist, scientist, and philosopher.

Precise details of his life are not well authenticated. He was born in the fortified hill village of Vinci, near Empoli in Florentine territory. Several celebrants arbitrarily set April 15, 1452, as the official birthdate; the third week of the month is as likely. His father was a notary in Florence, of a family who had been law-

yers for generations. His mother was a peasant girl. Though his parents were unmarried, the father's family recognized him and provided for his early training.

Leonardo showed interest in music and drawing. At the age of eighteen he joined the guild of painters and was apprenticed in the shop of Andrea Verrocchio, notable sculptor and painter. Several of Leonardo's early works are ascribed both to pupil and master. The government of Florence assigned Leonardo an altarpiece in the Signori palace. His first important pictorial work, *Adoration of the Magi*, was begun in 1476 for the San Donato convent. The next year Leonardo was favored by Lorenzo the Magnificent and worked under his patronage until 1482-83.

At this time Ludovico, duke of Milan, secured Leonardo's services. Decorations of halls in the Sforza castle and improvisations for fetes were ingenious. He supplied court portraits and started an equestrian statue of Francesco I, founder of the Sforza dynasty, on which he worked intermittently for ten years. Though completed only in plaster, it was greatly admired by contemporaries. In Milan Leonardo painted *The Virgin of the Rocks* and in 1495 began *The Last Supper* on the refectory wall of the Santa Maria delle Grazie convent. His architectural notes and models date mainly from 1487-90.

Here Leonardo's activities expanded to engineering and physics. He accompanied Ludovico on inspection tours of forts, examined projects for drainage, and worked out various problems of hydraulics. In 1498 he was appointed supervisor of all public

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Mr. Goldsmith's lectures on art history at the University of Pittsburgh 1950-52 included material on Leonardo da Vinci. At present he is doing substitute teaching on various subjects in the city public schools. He has written art and book reviews for a number of national publications and is doing some research in city planning. A Pitt graduate, he has done advanced study at Harvard in intellectual and scientific history and has been working for his Ph.D. degree.



works in Lombardy. He surveyed damages inflicted by storms on harbor structures.

When in 1500 the French armies invaded Milan, Leonardo left the city for Mantua, stayed briefly at the court of Isabella d'Este, and proceeded to Venice. The Republic commissioned him to draw plans for protection from periodic floods.

By the year's end he was again in Florence, studying and experimenting, finding time to complete a few paintings. A Florentine lady posed in 1503 to become *Mona Lisa*. Officials ordered a scene of the *Battle of Anghiari* which Leonardo undertook, but, wishing to experiment with an ancient technique, he damaged the painting, leaving it in that state.

Cesare Borgia engaged Leonardo as military engineer. The fortress at Cescenatico was entirely his creation. Leonardo was involved in a project to deviate the course of the Arno river.

The French general in Milan in 1504 invited Leonardo to return. Being in the service of Florence, he could remain only a few months. The French king himself asked that Leonardo be allowed to stay in Milan. However, in 1508, back in Florence, Leonardo was making notes on mathematics, physics, and anatomy, and compiling a treatise on hydraulics. That year he returned to Milan to continue studies in astronomy. Five years later he made plans for the draining of the Pontine marshes, the construction of the port of Civitavecchia, and in Rome set up a laboratory for optics. In 1516 he departed for France, where he directed research projects, made models for canals, continued drawings, and died on May 2, 1519, at the

castle of Cloux, near Amboise, a retreat offered him by Francis I.

Though Leonardo had many disciples in painting, as Francesco Melzi, who cared for him toward the last of his life and

preserved his notes, there is no reason to believe that a Leonardine academy existed in Milan. The sculptor, Benedetto Briosco, and especially the mathematician, Luca Pacioli, were among his friends.

History presents few figures more attractive and capable than the youthful Leonardo, skilled in recitation and in lute playing, in horsemanship, a powerful yet graceful figure, handsome with flowing locks, genial with all men: a perfect example of the Italian Renaissance intellectual. He was intensively studying classical literature and grammar at the same time that he was embel-

lishing the Sforza castle, developing chiaroscuro, observing lightning, supervising new civil engineering projects, and processing an iron mine.

A book could be written on his accomplishments in each field. In botany, for instance, he analyzed leaf arrangement. He understood fossilization. How remarkable Leonardo was as a scientist was not appreciated until the late nineteenth century. Yet he anticipated the scientific method and recognized principles of dynamics later exposed by Galileo and Newton. He suggested certain relativity and nuclear concepts, defined work, and called futile the seeking of perpetual motion as a source of power. Da Vinci was perhaps the first to experiment with pillars and beams under stress. He appreciated the fusiform or streamline. His research with lunes was



LEONARDO'S SELF PORTRAIT (c.1510)  
Turin, Royal Library

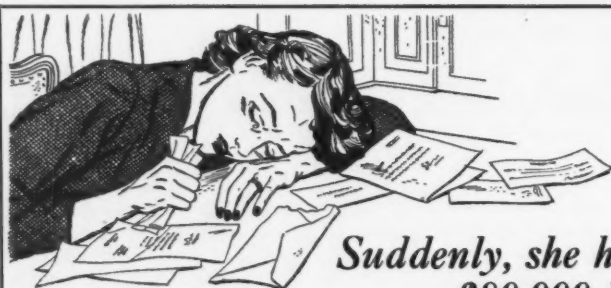
original. With qualifications one might say that Leonardo designed the first differential gear, rolling mill, power loom, and picture projector; he pointed out the similarities of the camera obscura to the eye. He invented the anemometer, made model flying machines, devised a gun with a breach-loading mechanism, a tank, gas mask, and a diving bell. He planned a canal with locks and forecast a city with multilevel highways, tunnels, and underground canals.

Italians from the twelfth century to the Renaissance engineered great public works, but Da Vinci's were more accurate in technical details. He utilized mechanical drawing and visualized inventions in their practical stage, considering exact conditions under which they would operate.

To be sure, other Renaissance artists were scientists: Bramante an engineer; Alberti and dei Franceschi thought in mathematics, Pisanello knew geology. Pollaiuolo and Signorelli excelled in anatomy. But would their drawings compare with the ingenious detail of Leonardo da Vinci's?

Though a peerless draftsman, it must be said that more frequently Leonardo used art to explain science. His drawings probed principles underlying every phenomena. Each finding was a point of departure toward newer discoveries; each study opened vistas, some limitless, as he delved into the effects of dark and light. He strove to be as accurate and complete as possible; he would include anything of possible relevancy. He noted everything and drew as he pondered. His research involved not only new sketches but also references to his own earlier drawings.

Leonardo's interests suffocated his assignments so he did not complete much of what he had planned. He failed to organize and publish his illustrated writings; as a result he died embittered. His quest to achieve complete knowledge, his desire for perfection—Michelangelo said that in this tragic pursuit Leonardo squandered his gifts as an artist—unmistakably deprived the world of masterworks. Was his time wasted? Hardly, considering Leonardo's concern for universal laws and profound insight into human nature.



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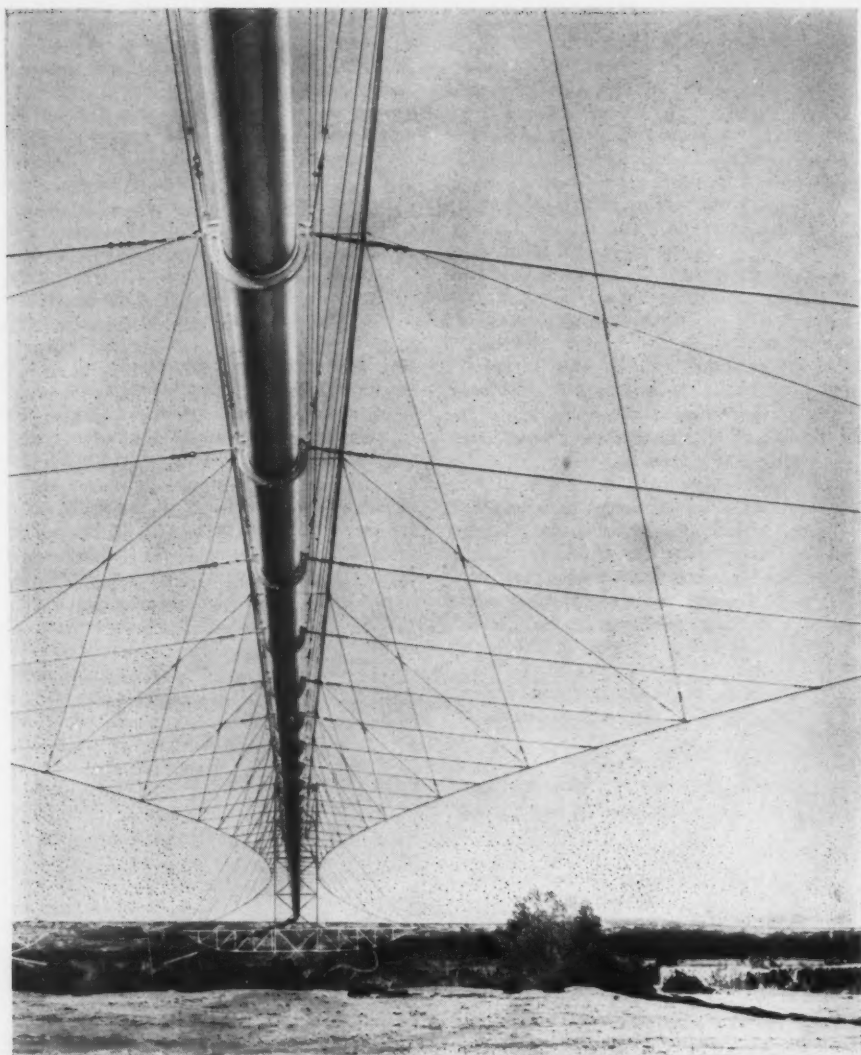
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"We have found some winged insects swarming in our basement; are they likely to be termites?"

"Some flying ants resemble termites," we replied. "If you find lots of loose wings lying around, then the insects are probably termites. Your best course is to bring or send some of the insects to the Insect laboratory so that they may be identified."

The "is it ant or termite" question is one that crops up only sporadically during the winter, but it gradually increases in frequency with the approach of spring, until the peak number of calls is reached at the end of April.

A day or two after the above conversation, we received an inquiry that we have come to expect almost any time throughout the year. This inquirer sounded more puzzled than worried.

"We have been finding fuzzy worms around our house. Most of them we find around the edges of the carpet and between the carpet and the carpet pad. Yesterday we found some in our clothes closet. Can you tell me what they are? Are they clothes moths? We haven't noticed any damage."

"What you probably have," we suggested, "are carpet beetle larvae. There are several different kinds. Some are bristly as you describe; others are somewhat slick in appearance with a tuft of long hairs at the tail end of the body."

"Yes, we have a few of those too, but most are shorter and with more bristles."

"The carpet beetles," we proceeded, "feed on hair and wool, and on fabrics made from these materials. The damage done by

carpet beetles is less apparent than that done by clothes moths, for the former seldom eat holes clear through the fabrics unless the infestation is very heavy. To combat carpet beetles, take up the carpets if possible and clean them, or if this is not convenient, roll back a side at a time, and vacuum-clean carpet and pad thoroughly on both sides. Before replacing the carpet and pad, spray lightly with a spray containing DDT in an oil base, the DDT being 5 to 6 per cent in strength. For protection of your clothes in closets and chests, place with these clothes a liberal quantity of paradichlorobenzene crystals."

Carpet beetles, clothes moths, and the flour and meal pests are busy indoors the year round. Many of the inquiries on outdoor insects are correlated with the seasons, like those on mammals noted by Miss Heppenstall and on birds by Miss Malmberg the past two months.

Shortly after the termite season has subsided, the "season" of hornets and bees is ushered in with questions on how to remove these insects from the premises. The "Cecropia season" is next, and the calls at this time refer not only to the large and beautiful *Platysamia cecropia*, but also to other representatives of the Giant Silkworm moths, such as the Luna Moth, and the Polyphemus. Then come the Cicada-Killer Wasp days, which coincide with the dog days of summer. As a rule, we seldom get a call about the cicadas themselves, unless it happens to be one of those years the Seventeen-Year Cicada is emerging. The Cicada Killer-Wasp, however, is such an awesome hornet-like creature that it always attracts attention. They frequently drill holes in lawns, and a dozen or more of the insects usually make their nests in the same vicinity. Consequently it is small wonder that the dubious homeowner decides these are undesirables, and



puts in a call to the Museum to see what methods of eviction may be safely used.

The approach of autumn is heralded by the following phone call:

"My children have just discovered a very large spider in the garden. It is black and yellow and is sitting in a large circular web in the weeds. Is it a Black Widow Spider?"

"No," we reassure the lady, "what your children have discovered is probably the Orange Garden Spider. It will not bite unless handled, and even then the amount of poison it contains would be too small to be dangerous. All spiders have some venom, but in this country only the Black Widow Spider is dangerously venomous. The Black Widow Spider has a body about the size and shape of an old-fashioned shoe button. Sometimes the top of the body is marked with red, but the underside always carries a red hourglass-shaped mark."

While the Orange Garden Spider season is still in full swing, the Chinese Mantis, common to the Pittsburgh region, comes of winged age, and commences to take to the air. Soon individual mantises are landing on street corners and in office windows. Many of these individuals are quickly discovered; curious people begin to collect, and surmises are made as to "whatzit." The resulting phone calls over the years have been almost identical:

"We have found a large grasshopper-like creature with six legs, the front ones very long. It is green and brown, and has a long neck and a triangular head. I have never seen anything like it before."

(I dislike being pedagogical, particularly via parenthesis, but I must break down here—six is the basic number of legs for insects in general.)

"What you have found," we answer, "is a Praying Mantis, probably the Chinese Mantis. It is a harmless and useful insect for it feeds on other insects. However if you wish to donate it to us, we will be glad to accept it for our collection." This last statement we add because we are always optimistically in hopes that some day we will be presented with a specimen (locally caught) of our native *Stagomantis carolina* whose range apparently stops just south of Pittsburgh. A phone conversation on the Praying Mantis never concludes without our explaining that the Chinese

Mantis is so named because it was accidentally introduced into this country many years ago on nursery stock brought from the Orient.

Queries on the Praying Mantis are not restricted to requests for identification. Nearly every year a number of calls come in asking for advice on keeping Praying Mantises for pets. These calls come during winter as well as late summer, for mantid egg cases that have been brought indoors by amateur naturalists suddenly begin hatching in January and February. In answer to such calls we point out that the Praying Mantis requires plenty of water, and prefers insects for food—either alive or freshly killed. Insects suitable as food for baby mantises are difficult to find in winter, but a little later, in early spring, plant lice may be found on the developing leaves of the Burdock—just pull the entire leaf and drop it into the mantis' box or cage.

From repeated experience we have worked out certain routine questions to help us identify or at least partially identify insects by phone. For example: "Where was it found?" or (as previously quoted) "Are there loose wings lying about?" Or (suspect—clothes moth): "Do the caterpillars make a web on the cloth?" Or (suspect—fleas): "Do you keep a dog or cat?" If the answer to this last question is negative, we become as relentless as detective Rocky King of television fame—"Has there been a dog or cat in your home during the last month or two?"

Sometimes from sheer vanity we venture a Sherlock Holmes-like deduction. For example, during one of the colder months a caller states:

"We have been finding in our house hard-shelled insects with two very long feelers. We find them at the windows, and the insects seem to be trying to get out."

"Ah," we reply (and the following remark has been handed down by virtually generations of curators in entomology),

---

Questions about insects and spiders are no novelty to Dr. Wallace, who joined the Museum staff in 1937. He had graduated from the University of Pittsburgh four years earlier and had been working as graduate assistant in zoology. He received his doctorate in 1940 at the University and was appointed curator in the Museum's section of insects and spiders in 1951.



"very likely you have a fireplace, and have recently laid in a supply of firewood in your house." Or—when the call is about an outbreak of some biting insects in the home—

"Have you perhaps just returned home from your vacation?"

The insects discovered at the windows are almost sure to be the long-horned beetles whose larvae bore in wood. Most of these beetles are outdoor insects which seek to lay their eggs in felled logs and dead trees that still retain the bark. When infested logs and limbs are brought into the house, the warmth soon brings about a premature emergence of the beetles which at once go to the windows in an attempt to get out of doors. The suggestion that the other inquirer had just returned from a vacation is not sheer guess; just-returned pet-owning vacationers are frequently ravenously set upon by fleas which have been expectantly fasting during the homeowners' absence.

On the other hand, there are questions that leave us feeling anything but omniscient. I wonder if Entomology gets more than its share of these? One type of such question is delivered in a quiet concise tone of voice that suggests a lawsuit in the offing; for example: "How long does it take a housefly egg to hatch?" Oops! That terrible guilty feeling that we should know this one offhand!

"It varies according to the temperature," we answer, "but we will have to look up the usual range of hatching time, if you will hold the line." And we hastily thumb through a circular on houseflies—one of the many circulars and pamphlets that we keep beside the phone for just such emergencies.

None of our "on hand" literature would have been of help the day that I was asked, "How are cobwebs formed?" An intriguing question, and one not so easily answered as might appear at first glance. By some freak of coincidence the question had briefly occurred to me a few days before. As I paused to gather my thoughts together the voice at the phone went on:

"Last night some of us became involved in a terrific argument at a cocktail party; somebody claimed that cobwebs are merely spiderwebs that have gathered dust, and others said that they can form without

spiderwebs. Who's right?" Before my mind's eye rose the picture of the occasion when we had left an oil heater burning and it had smoked during our absence. Surely there could not have been a number of spiderwebs present comparable to that maze of cobwebs that had confronted us. And I recalled also the festoons of soot that I had noticed hanging just inside the furnace door that very morning—hardly a place where spiders would spin webs.

"I believe cobwebs can form independently of spiderwebs," I ventured cautiously, and then set forth my reasons. "However," I continued, "you might check with Mellon Institute. Somebody there might better explain the physical characteristics and behavior of soot particles." The argument at that party must have been a warm one, for no less than four calls on that particular question came during the afternoon.

It was several years ago, and I do not recall the complete conversation, but I will never forget the question, "How long would it take an ant to complete the excavation for the University of Pittsburgh Nursing School?" This left me definitely on the ropes, and I now only remember thinking dazedly, "Well, how many teaspoonsful would that be?"

A similar bombshell was dropped by a very good friend of mine. He is a serious student of ornithology, and I still have not quite recovered my trust in ornithologists. His question was: "How many useful insects are there in Pennsylvania?"

Aside from these higher-voltage types of inquiries, we must humbly confess that we are often hard put to, and often cannot, answer what are perfectly fair entomological questions. Requests for determinations of fly maggots, for example, are promptly passed on to the U. S. Department of Agriculture, where there are entomologists who specialize on the classification of fly larvae. Spiders—aside from the very common ones—are referred to spider specialists at other museums. Even adult insects of certain difficult groups (for example half-inch long brown click beetles—there are dozens of species of these) may have to be sent to appropriate taxonomists. Nevertheless, answering inquiries on insects is a service that this Section takes genuine pleasure in performing.

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# The Joy of Learning

## THROUGH THE PUBLIC SCHOOL PROGRAM

OLGA CATIZONE



PITTSBURGH boys and girls enjoy a privilege not accorded to the school children of many other cities. They have a Museum in their city that has become a part of their educational program through a co-operative plan worked out with the Board of Education. Students make four visits to the Museum, one each year beginning in the fifth grade and ending with the eighth grade. By the time they are in high school, the Museum has become a meaningful place, a special kind of "reference book" to which they can return again and again.

The subject material used for each Museum lesson is selected jointly by the Division of Education science staff of Carnegie Institute and the elementary supervisors of the Pittsburgh Public Schools. Each grade has an approved list of subjects closely related to the science and social-studies classes of that particular grade level. The fine arts section of the Division of Education has a similar program in art. Therefore on each visit every student has two lessons, one in art and one in science. Each lesson lasts forty minutes.

From their textbooks at school the children learn about birds, mammals, dinosaurs and many other natural-history phenomena. They try to visualize what they have been taught, but only after they have actually seen the specimens at the Museum does it become real to them. I have often been asked, "Are those real dinosaur bones?" or "Was *Tyrannosaurus rex* really that size?" A child will never forget *Tyrannosaurus rex* after he has seen the actual fossil bones. The Museum helps to mold the image which the teacher has created in the child's mind. After the Museum visit the picture is in sharp focus, and back in the school room the teacher can pick up the loose threads and weave them into a definite pattern.

The fifth graders, since it is their first

visit, are taken on a get-acquainted tour. This is an orientation lesson in the natural-history section of the Museum. Special emphasis is placed on exhibits pertaining to nature in Pennsylvania.

The sixth grade has seven elective topics. One is "Pittsburgh Portrait," giving the history of Pittsburgh in a pictorial fashion. Another is "Nature's Playground," highlighting our national parks and explaining erosion, using the Grand Canyon as an example. The tour describing "Plants of Various Regions of the United States" is demonstrated by the exhibits in Botany Hall, such as MT. RAINIER, FLORIDA JUNGLE, ARIZONA DESERT, PENNSYLVANIA BOG, and SPRING FLORA OF PENNSYLVANIA. The effect of climate on plant growth is stressed in this lesson. "Animals Without Backbone" provides for the study of an assortment of animals: the lobster, crayfish, oyster, bee, ant, wasp. "Reptiles and Amphibians" is always a stimulating subject, and the students see the poisonous and nonpoisonous snakes, the turtles, frogs, toads, alligators, crocodiles, and lizards. "Birds and Their Value to Man" teaches the children the characteristics of birds and their esthetic and economic importance to man. "Our Fur-bearing Animals all over the World" is a presentation of the mammal group, bringing out their value as a source of furs, hides and food.

The seventh-grade elective program includes four subjects. "Civilization in the Valley of the Nile" covers the history of the Egyptians and some of their contributions in writing, medicine, and architecture.

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Dr. Catizone joined the education staff at the Institute in 1948, after doing part-time work at the Museum while taking her doctorate in biology at the University of Pittsburgh. She is a graduate of Pennsylvania College for Women and previously taught at Marygrove College, Detroit, and Mt. St. Vincent College, New York City.

Among her hobbies are chess and leadership of one of the Great Books groups at the Y. M. C. A., under sponsorship of the University of Chicago.

"A Tour through the Ages" gives an overview of the animals of the past, describing the dinosaurs, the prehistoric mammals and tracing the evolution of man. "Current Exhibits" covers the new exhibits, EXPEDITION HALL, MUSEUM BACKSTAGE and LIFE UNDER WATER. PITTSBURGH PORTRAIT is included again in the seventh-grade list to give more children an opportunity to learn about their city. If the sixth grade students do not make this tour the teacher has an opportunity to work it in with her seventh-grade program.

The eighth-grade tours consist of four topics. "Museum Afield" covers the stories about Museum expeditions. This includes areas selected and specimens sent back to the Museum for Study. "Behind The Scenes" is a demonstration on various museum techniques—mounting birds and mammals, making plants, snow, water, and rocks. "Pittsburgh On The Move" gives the history of transportation by land, water, and air, with special reference to Pittsburgh development. "Current Exhibits" is repeated in the eighth grade, allowing for selection at this age level instead of in the seventh-grade level.

In this way the school and the Museum work together to develop the whole individual. What these students have seen at the Museum has enriched their elementary education. They can apply it to their high school and college work. Many will not use the Museum as a direct source of information after they leave high school but they will return because they enjoy coming and they will bring their friends and out-of-town guests. The Museum for these young Pittsburghers is now not a new frightening place one must not venture into but is a place where they feel at home. It "lives" for them and is one of the many phases of their community life.

## FOR YOU AT THE LIBRARY

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Meticulous research is evident in this tale of the early Christians, and of the Emperor Decius who tried to avert the fall of a decadent Rome. The paraphernalia is ancient, but terms are modern.

### WINDOWS FOR THE CROWN PRINCE by ELIZABETH JANET GRAY (Mrs. VINING)

As tutor to the Crown Prince, Mrs. Vining interpreted the American way of life to the Japanese royal family who are building the future along western lines.

### MIDCENTURY JOURNEY by WILLIAM L. SHIRER

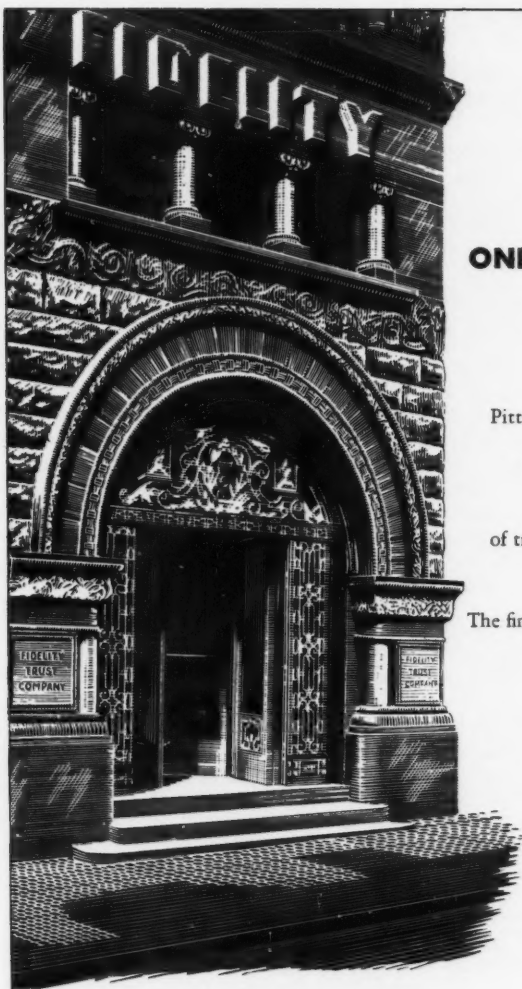
The author of *Berlin Diary* portrays, with facts and figures, Europe today as shaped by events of the last twenty-five years. He indulges in some startling might-have-been's and yet-may-be's concerning Germany, Russia, and the U. S. A.

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## THE NATURALIST'S BOOKSHELF

JAMES L. SWAUGER

*Curator of Man, Carnegie Museum*

### GODS, GRAVES, AND SCHOLARS: THE STORY OF ARCHAEOLOGY

By C. W. CERAM

Translated from the German by E. B. Garside

Alfred A. Knopf, New York, 1952

428 pages, 32 plates, 4 maps, numerous line drawings

I HAVE read one caustic review and heard several unfavorable comments on this book by professional archeologists. They are not happy with it. I think most of the dissatisfaction is caused not by the book but by its subtitle, "The Story of Archaeology." This is *not* the story of archeology.

The adverse criticisms leveled by professional archeologists are well taken. Whole cultures of great importance are not mentioned. Ceram's knowledge of recent advances—and some not so recent—in areas of the world which he has not treated must be deficient, to judge from some of the statements made in his Part V, *Books That Cannot Yet Be Written*. I winced a little myself at his statement that the history of archeological studies was buried in publications that "... were never written to be read." Of course they were written to be read. Not, to be sure, like a magazine that a person buys to while away a couple of hours on a train, but like honest studies eager to present facts and reasoned judgments. This may make them a bit difficult to those not willing to work a little, but for those whose interest is genuine, they were very much written to be read. These works which Ceram slights as difficult may be compared to a dispassionate survey of symptoms of illness. Most people would rather their doctors pored over works filled with evidence than generalized articles in newspapers in order to attempt their cures, although the general public might balk at such effort.

After saying what the book is not, and indicating to some extent why it is not, I pass on to what it is. In the foreword Ceram states, "My aim was to portray the dramatic qualities of archaeology. . .". Ah! Let us disregard the subtitle and move

forward on the basis that what Ceram wanted to do is covered by this statement. After all, any endeavor must surely be judged on the basis of what it is attempting; the subtitle may not have been original with Ceram, the proposal in the foreword is certainly Ceram's. Essentially it is not *the* story of archaeology, but a story *about* archeology.

This is a good book to read. It is sprightly, interesting, colorful, and sometimes philosophical, and presents a good public airing of some of the spectacular qualities of archeology and archeologists. The field is vast. The author had to pick and choose among the hundreds of excavations and excavators those digs and those men that appealed to him as particularly interesting and that he thought would interest the general public. Inevitably he had to choose just those exciting and immensely rewarding excavations that are already known at least by name to people who read, those men who through some quirk of fate or dour purpose and luck—for there is much luck in archeology—directed those excavations. This is not, I think, a fault. Ceram points out again and again that there were numerous investigators not so fortunate in their choice of sites or studies as to have their results blazoned across the world, and even some who, from genuine modesty, deliberately effaced themselves from wide publicity. It is very hard, if one wishes to dramatize, to concentrate on those excavations which have produced negative results.

The content of the book is divided into five parts, *The Book of the Statues*, which covers Pompeii, Troy, Mycenae, and Crete; *The Book of the Pyramids*, which deals with Egypt; *The Book of the Towers*, which treats of Mesopotamia; *The Book of the Temples*, which deals with Mexico; and *Books That Cannot Yet Be Written*, which speaks of the Hittites, the Incas, and the Indus Valley peoples. The professional might think the first four books



cover their subjects superficially, but he cannot help but be galled by the last. Here the treatment is a little cavalier. More is known of the cultures in this particular section, and there is more drama in the amassing of that knowledge, than Ceram admits. However, he sought for an effect, and he achieved it. Certainly the reader receives the distinct impression that here more work is needed, that future research may develop most interesting and valuable material.

An author seeking to write of dramatic sites and unique investigators can run riot through the years of archeology. The spirit of his work determines what he picks and chooses. Ceram chose well. What can be more dramatic than Pompeii under its blanket of lava, Troy proved no legend but fact, the tomb of Tut-ankhamen, the debris of the Biblical Flood, the Tower of Babel found, the purchase of an entire Maya city? This is by no means the catalogue of all the sites discussed by Ceram. As a sample it is not even devoted to the most dramatic of the excavations depending on a reader's particular interests. In general he has not been detailed to the point of monotony, nor superficial to the opposite point of meaninglessness. In discussing these and the other sites, he gives a fairly good picture of what was found, who found it, and what the finds mean. This is the meat of the book from the historian's or archeologist's point of view. It is also intriguing for the reader with only general interest.

Fortunately for Ceram, the exciting sites are often paired with astounding or eccentric men and events. Thus he kills two birds with one stone: the excitement of the finds, the uniqueness of the finders. For instance, there is Heinrich Schliemann. The son of a poor pastor of Mecklenberg, Schliemann found his imagination so stirred with an illustration of the burning of Troy in a book given him for Christmas when he was only seven years old that it haunted him through the years during which he prepared himself not only for archeology but for business by learning a dozen languages, working like a slave, and doting on the ancient Greek writers. At forty-eight he had become immensely wealthy for his day, cast aside his business interests, and set forth for the Troad.

Like Alexander, he slept with the *Iliad*; like Alexander, he was out to conquer; like Alexander, he did. For this amateur—indeed in 1870 almost anyone digging for traces of the past was an amateur—actually found the site of Troy. At Troy he decked his young Greek wife with jewels from what he thought was the "treasure of Priam"—what could be more fantastic? And from the point of view of fantasy, what does it matter that Schliemann's Sophia wore not the jewels of Priam—for Schliemann's identification of the level in which he found the jewels was wrong—but the jewels of a king dead a thousand years before the Troy of the *Iliad*?

And then this amazing man went to Greece and actually found the remains of the Achaeans—the Greeks of whom Homer wrote—at Mycenae, Orchomenos, and Tiryns, and projected a sort of cultural motherland in the Greek islands, specifically in Crete, and thus pointed the direction for the discovery of the ancient Minoan civilization by Sir Arthur Evans.

Schliemann was wrong in Greece, as he had been wrong at Troy. He had searched for Agamemnon and thought he had found him. But what boots it that he was off a thousand years at Troy, four hundred at Mycenae? He had found Homer's Troy and Homer's Greeks.

Schliemann's story is, I suspect, the most bizarre in the history of archeology. Only the truth could be so singular; fiction would not dare to touch it. But there are many others of almost equal rarity and in his story Ceram describes a lot of them. There is Champollion, a precocious linguist, enemy of Napoleon, who deciphered the Rosetta stone. There is Layard the impoverished, outwitting time and local bigwigs in Mesopotamia to find ancient Nimrud. Koldewey, the composer of jingles, locating the Tower of Babel. Stephens buying a Maya city that he might excavate it. And many, many more whose strange finds were little less extraordinary than their own strange lives.

A reader will not find in this book any real attempt to portray the civilizations discovered by these various excavators. He will not find a real history of the progress of archeology, technical or meaningful. But he will find a charming story of impressive excavations and interesting men.



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Blaw-Knox Company. *Music Hall, Tech, Advisory.*

\*A. L. WOLK  
City Council. *Auditing, Fine Arts, Library, Advisory.*

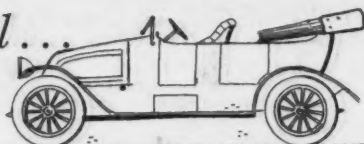
LAWRENCE C. WOODS, JR.  
Manager, Woods Agency, Equitable Life Assurance Society of United States. *Museum.*

*Whatever the make...*



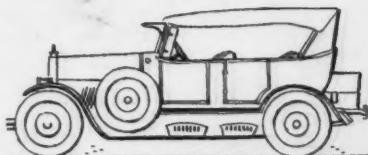
1902 Winston Surrey

*Whatever the model...*



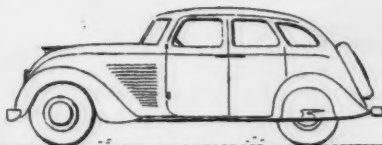
1915 Franklin

*Your car runs better*



1923 Haynes

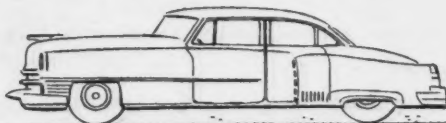
*...longer*



1934 Chrysler

*...with*

## GOOD GULF DEALERS' CARE



1952 Cadillac

*Gulf Oil Corporation*  
Pittsburgh, Pa.

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Pittsburgh 13, Pa.

University of Michigan,  
General Library,  
Ann Arbor, Michigan.

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